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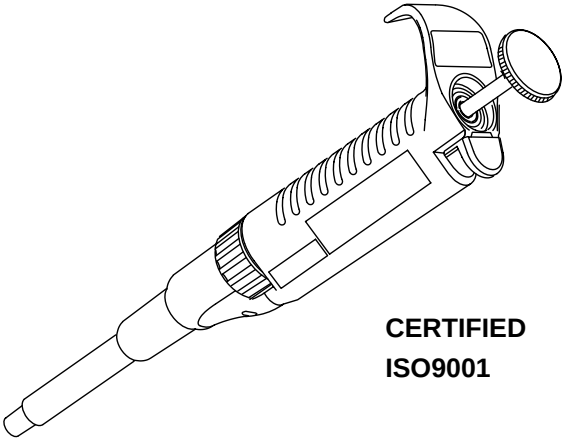
Mode d'emploi

Light & Ergonomic Pipette

NICHIRYO *Le*

Digital micro pipette for liquid handling

User's Manual



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NICHIRYO

Light & Ergonomic Pipette

NICHIRYO *Le*

- Thank you for purchasing the NICHIRYO *Le*.
- Before proceeding to work with the NICHIRYO *Le*, please carefully read this manual for proper use of it.

I. Introduction

This operator's manual explains the operation of the Nichiryo Digital Micro Pipette 'NICHIRYO *Le*'. Please read carefully to ensure safe and correct operation of the instrument. Please pay special attention to passages marked in bold lettering. Be sure to read cautions that need strict observance and underlined sections before using the instrument.

II. Features

- As volume amount setting is done digitally, easy volume setting is possible with a simple press of the push button.
- Through adoption of an easy to grasp design and a lightweight construction, (in comparison with our Nichipet EX model) we have realized a product design that allows long hours of use without operator fatigue.
- The structure of the unit has been designed to reduce the effects of hand temperature on performance accuracy.
- Our lineup of 5 different models allows a wide range of sampling, between 1.0ul – 1000ul.

III. Standard Accessories

- Tips: x 3
- Grease: x 1

IV. Safety Precautions

- Please be sure to carefully read the sections titled "Safety Precautions" and "⚠ Cautions:" before using the instrument.
- The contents of "CAUTIONS" are matters that require the user's attention, not only for using the Nichiryo Le properly but for preventing the user from accidents and physical damage.
- After reading this manual, please keep it in a convenient place for easy referral at any time.

Please read the following prior to use for your safety and correct usage of the instrument.

⚠CAUTIONS

Be sure to observe the following instructions for using the NICHIRYO *Le* properly and safely

1. Do not use this instrument for any purpose except pipetting liquid.
2. Do not modify this instrument as modification may cause an accident.
3. Do not use this instrument for pipetting any liquid to be injected into the human body.
4. Do not eject the tip towards anybody.
5. Do not discharge any sample liquid while pointing the instrument at anybody. Some liquids are dangerous and may cause bodily harm.
6. Do not eject the tip while liquid is still inside.
7. Handle the tip with care, as the point is sharp and dangerous.
8. Firmly attach the tip to the nozzle. If not attached securely it may fall off causing the sample liquid to scatter.
9. When handling liquid harmful to the human body, be careful not to directly touch the tip during or after use.
10. If the instrument is soiled with liquid harmful to the human body, immediately take proper measures to clean it safely before proceeding with work.
11. Do not use this instrument for stirring liquid or for any other such action. Additionally, do not use the instrument in any manner that will cause the tip to loosen, fall off, or the instrument itself to be soiled with scattered liquid.
12. Do not use this instrument for any purpose except pipetting liquid.

ⓘ Matters that require strict observance

Users are required to strictly observe the following points in order for the instrument to retain its excellent precision, reproducibility and original performance for a long time.

1. Do not expose this instrument directly to the sun when working with it, or for 2 hours before starting work, otherwise the instrument may fail in precise pipetting. Avoid working with this instrument in a humid and hot place.
2. Just before starting work with this instrument, avoid touching the tip and nozzle cylinder as far as circumstances permit. If the nozzle cylinder is warmed by your hand, it is hard to maintain accuracy.
3. For pipetting, follow the forward method (the way explained in this manual). If it is performed in a different way, it may result in inaccurate pipetting.
4. Operate the push button gently. If quickly released, sample liquid will be sucked into the main body, which may result in not only inaccurate pipetting but also deterioration of the instrument.
5. Do not hold the instrument horizontally or upside down when there is liquid inside the tip, otherwise the liquid will get inside the main body, which may cause deterioration of the instrument.
6. If liquid is sucked inside the main body (inside the nozzle), clean as quickly as possible. Liquid inside the nozzle is a main cause of precision/ reproducibility loss and may lead to breakdown of the instrument.
7. When turning the push button, do not exceed the specified sample volume limit, as this may damage the instrument or cause deterioration.
8. Do not perform pipetting with less liquid than the set volume. If the quantity is less than the set volume, this may cause the liquid to scatter into the main body, which may result in deterioration of the instrument.

V. Operation

1. Volume setting

(For each volume, the graduation consists of three numerical values that are read from top to bottom).

Turn the push button to the left or right, aligning it with the numerical value of the desired volume.

✶ Graduation units of each model are as shown in the chart below.

Volume graduation unit chart

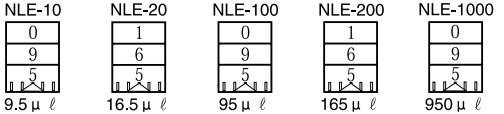

Fig.A

Observe the following cautions when setting volume

① When setting to an increased volume → First exceed the desired setting graduation by about 1/3 revolution, then adjust the indication to the desired graduation.

② When setting to a decreased volume → Slowly turn to the precise point, being careful not to go past the desired graduation setting.

⚠ Caution:

- **Do not exceed the stipulated volume range or change the volume capacity.**
  This could damage the instrument or impair quality.
  (Never turn the push button more than 1/3 revolution past the maximum stipulated volume).

2. Suction (Forward method)

1) Attach the disposable tip to the nozzle end. Make sure that it is attached securely (we recommend that you attach the tip from the rack).
2) Press the push button down to the first stop position. (a→b position in Fig.B).
3) With the push button depressed, insert the tip vertically into the liquid to be suctioned. Insert to a suitable depth (about 3mm). (Fig.C-①).
4) Slowly release the push button to its original position (Fig.B, position a) drawing the liquid inside. At this time, after the push button is returned to its original position, hold still for about 1 second, waiting until all the liquid is completely drawn in. (Fig.C-②).
5) Remove the tip slowly from the sample liquid. If done slowly almost no liquid will remain on the outside surface of the tip. If liquid does remain (such as with sample liquids that have a strong viscosity), wipe the tip with paper or something similar, being careful not to touch the liquid with your hand.

⚠ Caution:

- **Do not suction liquid from the C position in Fig.B.**
- **Operate the push button slowly and smoothly. If released quickly the liquid may be sucked into the unit resulting in an inaccurate liquid amount.**
- **Never suction liquid directly from the nozzle point, without the tip attached.**

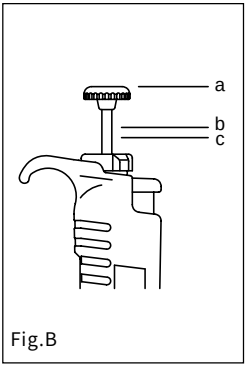

Fig.B

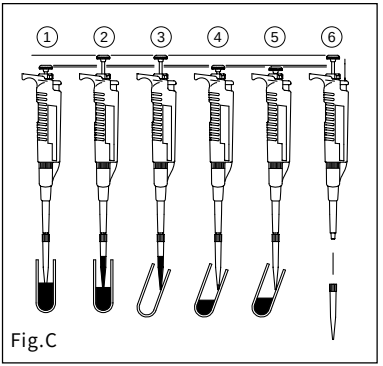

Fig.C

3. Discharge

1) Place the tip point against the inside (inner wall) of the receiving vessel. (Fig.C -③).
2) Slowly depress the push button to the first stop position. (a→b position in Fig. B). Wait about 1 second and then depress it further to the second stop position (c position in Fig.B). (Fig.C-④,⑤).
3) With the push button still depressed (at the C position of Fig.B), remove the tip point from the receiving vessel while sliding it upward along the inner wall of the vessel.
   When removing the tip point from the discharged sample be careful not to release the push button as liquid will be draw inside the tip again.
4) Release the push button.
5) Press the ejector button to remove the used tip and dispose of it.

⚠ CAUTION:

- **When handling liquid harmful to the human body, be careful not to directly touch the tip during or after use.**

(Reference)

1) Pre-rinsing

When attaching a new tip, before sampling, repeat suction and discharge of liquid to the first stop position 2 to 3 times.
Pre-rinsing will result in a high degree of accuracy. In addition, especially when strict reproducibility is sought, we recommend this method when sampling various types of liquid.

2) Sampling high density liquids and viscous solutions

When suctioning, once the liquid has entered the tip, wait 2 to 3 seconds before removing the tip from the liquid. When discharging, wait 2 to 3 seconds at the first stop position before pushing to the second stop position.

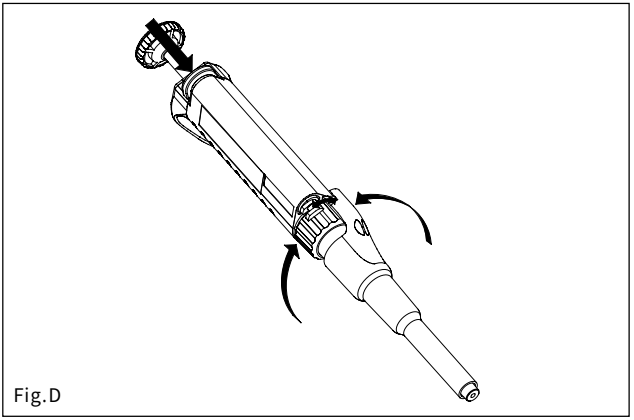

Fig.D

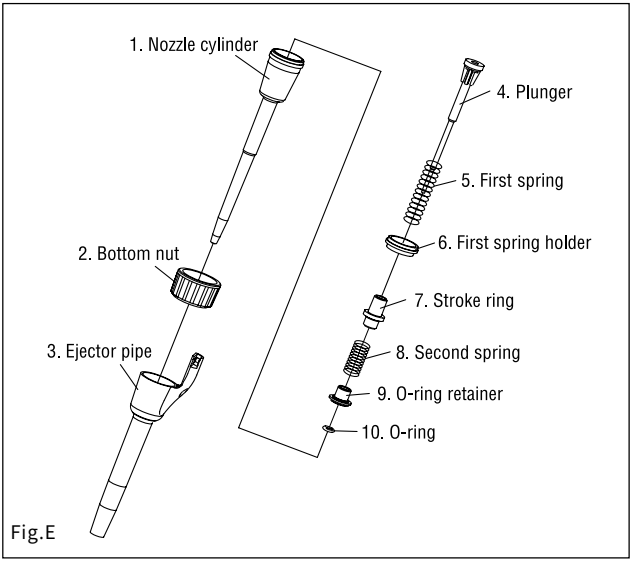
1. Nozzle cylinder
2. Bottom nut
3. Ejector pipe
4. Plunger
5. First spring
6. First spring holder
7. Stroke ring
8. Second spring
9. O-ring retainer
10. O-ring

Fig.E

VI. Disassembly and assembly of airtight section

For airtight section maintenance, or when a problem such as that clearly stated in the “Trouble Shooting” section of this manual occurs, carry out disassembly, inspection and cleaning following the instructions below.

1. Disassembly

1) Remove the ejector pipe.
   With the ejector button depressed, slide the ejector pipe to the right (clockwise direction) and remove from the ejector shaft. Next, pull out the ejector pipe. (Refer to Fig.D).
2) Remove the bottom nut.
   While holding down the nozzle cylinder, turn the bottom nut counter clockwise and remove from the body.
   At this time the spring inside the nozzle cylinder may cause the internal parts to pop out. Please use care and remove slowly.
3) Remove each part.
   Remove the parts in the nozzle cylinder: First spring plunger, first spring holder, second spring and O-ring. (The plunger and first spring holder are a complete set on the 1000ul model). Once removed, carry out part replacement, inspection and cleaning of the airtight section.

⚠ CAUTION:

- **During disassembling take care not to lose any of the parts.**

2. Assembly

✶ Basically assembly is done in the reverse order of disassembly. (Refer to Fig.E).

1) Set the O-ring on the O-ring holder.
2) With the plunger tip facing upward, attach each part in the order of first spring→ first spring holder → stroke pipe → second spring → O-ring retainer→ O-ring. Next, insert in the nozzle cylinder.
3) Install the ejector pipe. Install in the reverse order of disassembly.

⚠ CAUTION:

- **After assembly, before using the unit, test-operate it a few times to confirm that there are no problems**

VII. Specifications

Code	Volume range (ul)	Measured volume (ul)	Accuracy (%)	Reproducibility (%)
NLE-10	1 – 10	1	＊± 6.0	＊≦ 5.0
		5	± 2.0	≦ 2.0
		10	± 1.2	≦ 0.8
NLE-20	2 – 20	2	＊± 5.0	＊≦ 3.0
		10	± 2.0	≦ 2.0
		20	± 1.2	≦ 0.8
NLE-100	10 – 100	10	± 2.0	≦ 1.0
		50	± 1.2	≦ 0.8
		100	± 1.0	≦ 0.6
NLE-200	20 – 200	20	± 1.2	≦ 1.0
		100	± 1.0	≦ 0.8
		200	± 0.8	≦ 0.6
NLE-1000	100 – 1000	100	± 1.2	≦ 0.8
		500	± 1.0	≦ 0.6
		1000	± 0.7	≦ 0.5

＊ Accuracy and reproducibility of 1ul on the NLE-10 model and 2ul on the NLE-20 model will be greatly influenced by the operator's sampling skill.

VIII. Trouble Shooting

Problem	Probable cause	Solution
Liquid is not suctioned	Inside of nozzle cylinder point is clogged (foreign matter buildup)	Clean or replace the nozzle cylinder part.
	The nozzle cylinder is loose	Retighten the bottom nut.
	The O-ring is worn	Replace the O-ring.
Suctioned liquid leaks from the tip	The O-ring is worn	Replace the O-ring.
	Airtight section lubricant (grease) has been used up.	Grease the airtight section.
	Nozzle cylinder point is worn. (Visual inspection shows level difference).	Replace the nozzle cylinder.
	Plunger surface is scratched or damaged.	Replace the plunger.
	The tip being used does not fit the nozzle.	Change the tip used.
Push button operation is poor	Plunger O-ring lubricant (grease) has been used up.	Grease the plunger and O-ring.
	Liquid has been drawn into the unit (inside of nozzle cylinder)	Disassemble the lower part and clean.
	Plunger surface is dirty or foreign matter has adhered to it.	Disassemble the lower part and clean or replace the plunger.

✶ If you experience any problems other than those noted above, or if there is still a problem even after carrying out the recommended solutions, please stop using the instrument immediately and request service. At that time please be sure to make sure that the instrument is not contaminated with any substances such as microbes or chemicals that are harmful to the body.

■Replacement parts list (Service parts list)

Part No.	Part name	
1	Nozzle cylinder	Please state volume size.
2	Bottom nut	Same for all volume sizes.
3	Ejector pipe	Please state volume size.
4	Plunger	Please state volume size.
5	First spring	Please state volume size.
6	First spring holder	Please state volume size.
7	Stroke ring	Please state volume size.
8	Second spring	Please state volume size.
9	O-ring retainer	Please state volume size.
10	O-ring	Please state volume size.

✶ As the above replacement parts are specifically designed for each volume size, please indicate the volume size of your instrument when placing your order.

■Nichiryo Genuine Tips

●Tips (Autoclavable)

Code	Volume range (ul)	Color	Applicable model	Tip length (approx. size)	Number of tips
BMT-SS	0.1 – 10	white	NLE-10	45.5 mm	1000 tips
BMT-SG	2 – 200	white	NLE-20 / 100 / 200	53 mm	1000 tips
BMT-L	100 – 1000	blue	NLE-1000	77 mm	1000 tips

●Racked tips (Autoclavable)

Code	Volume range (ul)	Color	Applicable model	Number of tips
BMT-SSR	0.1 – 10	white	NLE-10	960 tips (96 tips x 10 cases)
BMT-SGR	2 – 200	white	NLE-20 / 100 / 200	960 tips (96 tips x 10 cases)
BMT-LR	100 – 1000	blue	NLE-1000	1000 tips (100 tips x 10 cases)

For repair, service or information please contact your local distributor.

MANUFACTURER:

NICHIRYO

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